

PATENT SPECIFICATION



600,619

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PROVISIONAL SPECIFICATION

Improvements in and relating to the Production, Storing and Distribution of Acetylene

I, CHARLES HENRY BINGHAM, of 22, Ashley Place, London, S.W.1, a British Subject, do hereby declare the nature of this invention to be as follows:—

6 This invention relates to the production, storing and distribution of acetylene and the invention consists in a plant for this purpose which includes a common manifold, or manifolds, adapted to discharge acetylene from a number of dissolved acetylene cylinders through a pressure regulating device so that the acetylene is capable of being delivered at a desired and permitted pressure into a 10 pipe-line for distribution to a common point of consumption, the said manifold, or manifolds, being also adapted to serve the purpose of charging the cylinders with acetylene by the provision of suitable 15 charging equipment.

The charging equipment employed would be capable of charging the cylinders to any pressure up to the customary pressure approaching but not exceeding 20 the usual maximum permitted limit of 225 lbs. per sq. inch at a temperature of 60 degrees Fahrenheit or any variation of such maximum permitted limit.

By the adoption of plant according to 25 my invention, the transport of full and empty dissolved acetylene cylinders between a factory manufacturing dissolved acetylene and a works employing dissolved acetylene is avoided. Also, the 30 work of connecting and detaching full and empty cylinders respectively to and from the manifold is practically eliminated as with the plant provided by my invention it would only be necessary occasionally 35 for the cylinders to be detached from and attached to the manifold for purposes of maintenance and replenishment of acetone, etc.

Generally, two or more manifolds 40 would be provided depending upon the particular circumstances prevailing whereby to facilitate working and maintenance.

[Price 1/-]

Usually the plant would include a low pressure automatic acetylene generator 50 for manufacturing the dissolved acetylene, but it is desired to include within the scope of the invention the use of a medium or high pressure automatic acetylene generator, in which case, however, a separate gas holder would probably not be necessary as such generators, i.e. medium or high pressure generators, are usually constructed to store sufficient acetylene within themselves and/or in a separate gas storage space, consisting generally of an acetylene receiver in the form of a plain closed and suitable steel vessel.

It may be preferred, and especially in the case of installations which are required to operate regularly, to provide two acetylene generators so that one may be cleaned and overhauled while the other generator is in use. Similarly, it may be preferred to duplicate any purifiers and driers included in the plant.

A typical plant lay-out in accordance with my present invention comprises the following units connected in series with one another in the order given:—

(a) A low pressure acetylene generator comprising usually a cone-shaped hopper on top of the generator from which carbide is automatically dropped into water contained within the generator, means being provided for removing the resultant sludge and to maintain the supply of carbide in the hopper. Provision is also made to renew and/or maintain the water in the generator body from time to time;

(b) A safety water seal adapted to relieve any accidental excess of pressure of the acetylene in the generator and which might otherwise cause damage to the generator;

(c) A washer through which the acetylene from the generator passes and in which the gas is cooled and washed, this washer constituting also a "flashback" 85 arrestor;

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- (d) A purifier in which one of the well known purifying materials is placed mainly in order to remove gaseous compounds of sulphur and phosphorous from the acetylene;
- (e) A gas holder in which the low pressure acetylene may be stored. In the operation of this gas holder as the same falls to a predetermined level it is arranged to operate through a cable, a ratchet wheel and an arm and weight on the generator to cause a further charge of carbide to be dropped from the carbide hopper into the water in the generator;
- (f) A low pressure acetylene drier generally filled with calcium chloride;
- (g) A pulsometer consisting of a simple gas holder with a water sealed bell and provided to smooth out any variations in the suction of the compressor;
- (h) An acetylene compressor for charging the dissolved acetylene cylinders and which compressor is usually of the piston and cylinder three stage-water cooled type;
- (i) A high pressure drier generally filled with calcium chloride;
- (j) A cylinder charging and discharging manifold to which the dissolved acetylene cylinders are connected and which manifold would be fitted with a flashback arrestor or arrestors adapted to prevent any explosion in a cylinder or cylinders or in the manifold from travelling back towards the compressor or to any other part of the installation on the inlet side of the manifold;
- (Where the installation comprises a plurality of manifolds, flashback arrestors would be fitted to prevent any

explosion in a cylinder, or cylinders, or in a manifold, or manifolds, from travelling to any other manifold, or manifolds, or back towards any other part of the installation on the inlet side of the 45 manifold, or manifolds;)

(k) A pressure regulating device by which acetylene from the dissolved acetylene cylinders of the manifold, or manifolds, is fed to the pipe-line at any 50 desired and permitted pressure;

(l) A flashback arrestor intended to prevent any possibility, when the acetylene delivered by the pipe-line is used for oxy-acetylene welding and/or cutting, of 55 oxygen at a higher pressure than the acetylene penetrating into the dissolved acetylene cylinders or into any part of the installation on the inlet side of the flashback arrestor, and which would also 60 prevent any flame or other gas from so penetrating these parts of the installation; and

(m) An acetylene pipe-line carrying 65 the acetylene to the point or points of consumption.

The invention, however, is not limited to the employment of acetylene generating plant according to the specific example above described, but is capable of modification to meet particular requirements and practical conditions. For example, the acetylene generator employed may be such as relies upon water being dropped onto carbide while 70 further the use of an automatic low pressure generator is not essential.

Dated this 9th day of February, 1945.
MARKS & CLERK.

COMPLETE SPECIFICATION

Improvements in and relating to the Production, Storing and Distribution of Acetylene

- I, CHARLES HENRY BINGHAM, of 22, Ashley Place, London, S.W.1, a British 80 Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—
- This invention relates to plant for use in the production of acetylene, and delivery to the point or points of use.
- The invention has for its object to provide an improved lay-out of plant for the 90 above purpose, the adoption of which will obviate the necessity of transporting full and empty dissolved acetylene cylinders between a factory supplying dissolved acetylene in cylinders and a works 95 utilising the same.

The invention consists in plant for pro-

ducing acetylene and delivering it to a point or points of use comprising, a low pressure generator, compressor means receiving acetylene from the generator 100 and delivering it to a manifold having a plurality of dissolved acetylene containers connected thereto, a pipe-line from said manifold to the point or points of use, and pressure regulating valve 105 means in said pipe-line.

The compressor employed would be capable of charging the cylinders to any pressure up to but not exceeding the maximum permitted limit of 225 lbs. per 110 square inch at a temperature of 60 degrees Farenheit.

With plant in accordance with the invention the work of connecting and disconnecting full and empty dissolved 115

acetylene cylinders respectively to and from the manifold is practically eliminated as with the plant provided it would only be necessary occasionally for 5 the cylinders to be removed from the manifold for purposes of maintenance and replenishment of acetone, etc.

Two or more manifolds may be provided, if desired, to facilitate working 10 and maintenance. If two manifolds were employed these would be arranged in parallel with a plurality of dissolved acetylene containers connected to each manifold. With such an arrangement, 15 while the compressor was delivering acetylene to one manifold and thus charging the cylinders connected thereto, the other manifold would be available for delivering acetylene from its cylinders through 20 the regulating valve means to the pipeline.

It may be preferred, and especially in 25 the case of installations which are required to operate regularly, to provide two acetylene generators so that one may be cleaned and overhauled while the other generator is in use. Similarly, it may be preferred to duplicate such purifiers and driers as are included in the plant.

30 A plant arranged according to the invention has the advantage of employing only a low pressure acetylene generator (operating at a pressure of a few inches of water column). Such a generator is 35 simple, safe and reliable in operation, yielding a high volume of acetylene for a given weight of calcium carbide and can thus be made in a convenient size sufficient to meet all requirements. On the 40 other hand, oxy-acetylene welding blow pipes operate more efficiently when fed with acetylene at pressures which, though varying with the character of the work being done, are higher than that which 45 can be supplied by a low pressure generator, and by a plant arranged according to this invention these desired pressures are obtained by compressing the acetylene into the dissolved acetylene 50 cylinders and discharging it from the latter through the pressure regulating valve means which controls the pressure at which the acetylene is desired to be used.

55 Further, it is to be appreciated that, in such a plant as is provided by the invention, the charged dissolved acetylene cylinders provide a reserve of acetylene available for use at points along the pipe- 60 line when the generator, compressor or other units of the generating plant break down or are being repaired or serviced. Also by the use of dissolved acetylene cylinders any variations in pressure 65 caused by the generator or compressor are

smoothed out, and thus acetylene at a substantially constant pressure is supplied to the pipe-line to ensure a more efficient operation of the apparatus being used therealong. 70

The accompanying drawing shows in diagrammatic form a typical plant layout in accordance with my invention.

In carrying the invention into effect in one convenient manner as illustrated a 75 plant for generating, storing and distributing acetylene comprises a low pressure acetylene generator *a* comprising usually a cone-shaped hopper *b* on top of the generator from which hopper carbide is 80 automatically dropped into water contained within the generator, means being provided for removing the resultant sludge and for maintaining the supply of carbide in the hopper and provision 85 being also made to renew and/or maintain the water in the generator body from time to time. The generator is included in a pipe-line circuit which contains, in the order named, the following 90 components:—

1. A safety water seal *c* adapted to relieve any accidental excess of pressure of the acetylene in the generator and which might otherwise cause damage to 95 the generator;

2. A washer *d* through which the acetylene from the generator passes and in which the gas is cooled and washed, this washer constituting also a "flashback" 100 arrestor;

3. A purifier *e* in which one of the well known purifying materials is placed mainly in order to remove gaseous compounds of sulphur and phosphorus from 105 the acetylene;

4. A gas holder *f* in which the low pressure acetylene may be stored. In the operation of this gas holder, as the same falls to a predetermined level it is arranged 110 to operate through a cable *g* a ratchet wheel *h* and an arm *i* and weight *j* on the generator, to cause a further charge of carbide to be dropped from the carbide hopper *b* into the water in the 115 generator;

5. A low pressure acetylene drier *k*, generally filled with calcium chloride;

6. A pulsometer *l*, consisting of a simple gas holder with a water sealed 120 bell and provided to smooth out any variations in the suction of the compressor;

7. An acetylene compressor *m* which is capable of operating up to a maximum 125 pressure of 225 lbs. per square inch for charging a series of dissolved acetylene cylinders connected to a manifold; this compressor may be of the piston and cylinder, 3-stage water cooled type; 130

8. A high pressure drier, indicated generally at *n* and usually filled with calcium chloride;
9. A cylinder charging and discharging manifold, indicated generally at *o* and to which the dissolved acetylene cylinders *p* are connected. This manifold would be fitted with a flashback arrestor, or arrestors, adapted to prevent any explosion in a said cylinder (or cylinders), or in the manifold, from travelling back towards the compressor, or to any other part of the installation on the inlet side of the manifold;
15. (Where the installation comprises a plurality of manifolds, flashback arrestors would be fitted to prevent any explosion in a cylinder, or cylinders, or in a manifold, or manifolds, from travelling to any other manifold, or manifolds, or back towards any other part of the installation on the inlet side of the manifold, or manifolds;)
20. A pressure regulating device *q* by which acetylene from the dissolved acetylene cylinders of the manifold, or manifolds, is fed to the pipe-line at any desired and permitted pressure;
25. A flashback arrestor *r* intended to prevent any possibility, (when the acetylene delivered by the pipe-line is used for oxy-acetylene welding and/or cutting) of oxygen at a higher pressure than the acetylene penetrating into the dissolved acetylene cylinders or into any part 35 of the installation on the inlet side of the flashback arrestor, and which would also prevent any flame or other gas from so penetrating these parts of the 40 installation; and
30. An acetylene pipe-line *s* carrying the acetylene to the point or points of consumption.

In my co-pending Application No. 45 779/45 (Serial No. 600,617) I have described and claimed a plant for producing acetylene and delivering it to a point or points of use comprising, a low pressure generator, a pipe-line receiving 50 acetylene from the generator and extending to said point or points of use, com-

pressor means in the pipe-line delivering acetylene to a manifold to which is connected a plurality of dissolved acetylene containers, the acetylene being discharged 55 from the cylinders and the manifold through a pressure regulating device into the pipe-line for delivery to the point or points of use, and a second pipe-line in parallel with the first mentioned pipe-line, said second pipe-line receiving acetylene from the generator and delivering it to a manifold to which is connected a plurality of dissolved acetylene containers adapted to be removed from the manifold 60 for use where desired, and compressor means in the second pipe-line between the generator and the manifold.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A plant for producing acetylene and delivering it to a point or points of use 75 comprising, a low pressure generator, compressor means receiving acetylene from the generator and delivering it to a manifold having a plurality of dissolved acetylene containers connected thereto, a 80 pipe-line from said manifold to the point or points of use, and pressure regulating valve means in said pipe-line.

2. A plant as claimed in Claim 1, wherein the compressor means delivers 85 the acetylene to two manifolds arranged in parallel, each manifold having a plurality of dissolved acetylene containers connected thereto, the arrangement being such that while one set of 90 containers is being charged through its manifold the other set is available for discharge through its manifold and the pressure regulating valve means to the pipe-line.

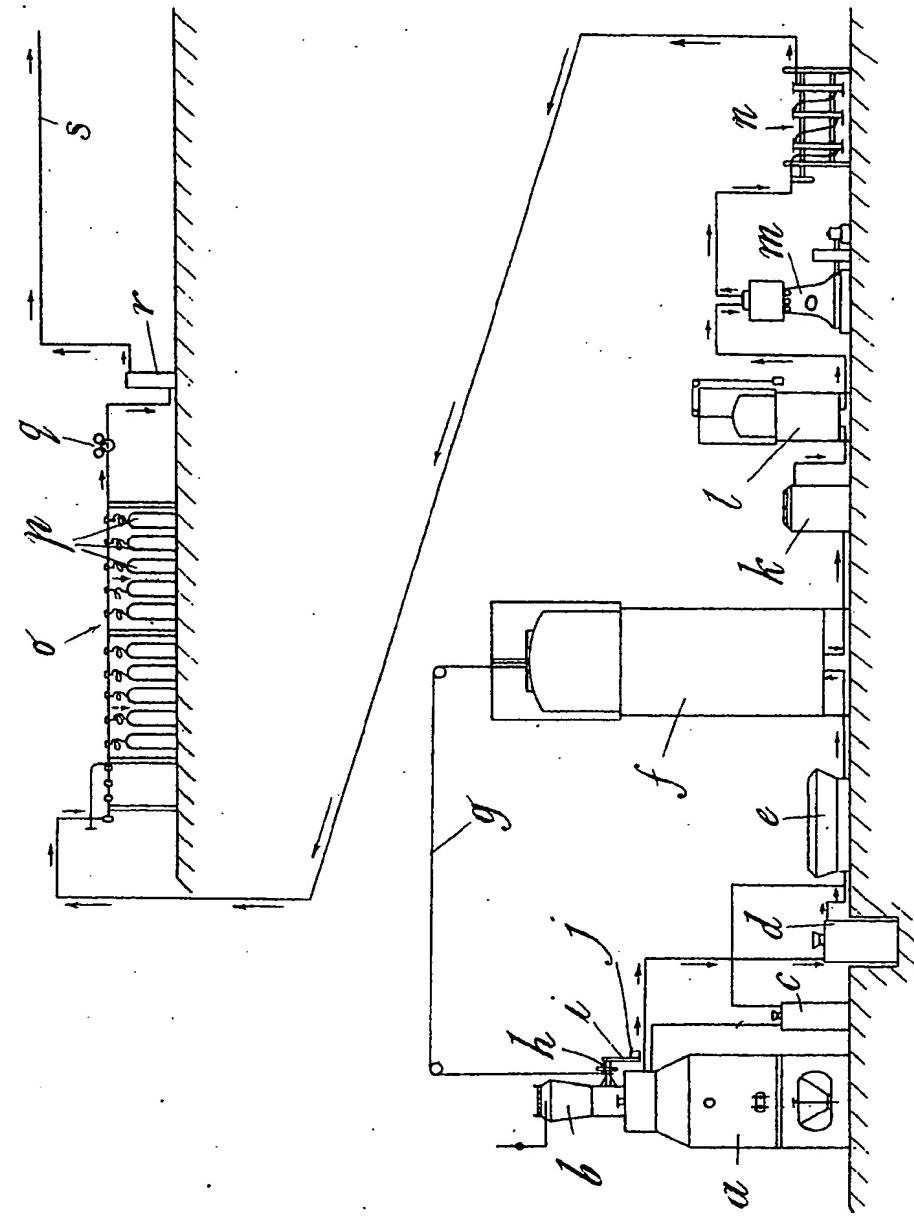
3. A plant for producing acetylene and delivering it to a point or points of use, substantially as described herein with reference to the accompanying drawing.

Dated this 4th day of February, 1946.
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copies, price 1s. Od. each (inland) 1s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]



H.M.S.O. (T.P.)

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